

# **UAB Department of Ophthalmology Clinical Research Unit**

## **2003 Seminar Series**

*"Designing Questionnaires and Data  
Collection Forms (or, How to Avoid  
Garbage In . . . Garbage Out)"*

EXHIBIT

5  
Garage



# **Future Seminars**

- **May 14**      **Database Design & Management (or, We're Not Talking Filing Cabinets)**



*"Designing Questionnaires and  
Data Collection Forms (or, How to  
Avoid Garbage In . . . Garbage Out)"*



# What is a Questionnaire?

- A questionnaire is any written document used to instruct one or more reader(s) or listener(s) to answer one or more questions.
- Questionnaires are sometimes called “instruments” or “survey instruments.”
  - Questions may be called “items.”
  - Individuals who answer the questions may be called “respondents” or “interviewees.”



# Scientific Aspects

- Reliability
  - ask a question today, get a response
  - ask the same question tomorrow or next week, get the same response
- Validity
  - extent of agreement between response and the “true” value of variable



# Scientific Aspects

- Principles of questionnaire construction:
  - Should be designed to meet specific purpose (e.g., managerial, administrative) or test specific study hypotheses (research)
  - Q'naire should not exceed optimal length
  - Questions should exhibit brevity and clarity
  - Response options should be exhaustive and mutually exclusive
  - Need rationale for inclusion of each question



## **“Art” Aspects**

- Use terms that target audience (respondents) will understand
  - diabetes, sometimes called “sugar diabetes”
- Be culturally sensitive
- Show respect for the respondent’s dignity and privacy



# Questionnaire Design - First Step

- Before beginning to construct a questionnaire, ask:
  - Is a questionnaire the best method of data collection for your study/project?
  - Have you considered alternatives (e.g., medical record review, lab tests, health professional's assessments, etc.)
  - What are the major areas that need to be covered and what method will be used?



# Questionnaire Design

- Mode of administration generally influences questionnaire design.
- Primary modes include:
  - Mail or other self-completed
  - Face-to-face
  - Telephone
  - Web-based



# Mailed Questionnaires

- Advantages

- low cost
  - administrative requirements in terms of personnel, costs per respondent and costs per geographically dispersed respondent are marginal
- locating respondents may be easier
  - especially if surveying homogeneous, specialized populations
- social desirability bias, interviewer distortion minimized



# Mailed Questionnaires

- Disadvantages
  - no opportunity to monitor completion
    - no control can be maintained over sequence in which questions answered
    - respondents may not read and/or answer some questions
  - respondent can't ask questions
  - few complex, open-ended, screening and/or tedious questions can be used



# Mailed Questionnaires

- Disadvantages (continued)
  - sample bias (literacy and education level)
    - may not be possible to determine characteristics of non-responders and reasons for refusal
  - poor initial return rates
  - repeated mailings take time
    - may be > 3 months before data available for analysis



# Face-to-face Interview Questionnaires

- Two main types
  - Written
    - interviewer reads structured or open-ended question and records response
  - CAPI (computer-assisted personal interview)
    - menu-driven questionnaire is loaded on laptop computer and interviewer reads question and records response (coded or open-ended)



# Face-to-face Interviews

- Advantages

- direct interaction with respondent
  - respondents can ask questions
  - interviewer can control question sequence
  - non-verbal feedback may yield important clues
- conducive to obtaining representative sample of both listed and incompletely listed (e.g., household occupants) populations
  - possible to obtain/document characteristics of non-responders, reasons for refusal, etc.



## Face-to-face Interviews

- Advantages (continued)
  - allows flexibility in questionnaire length and question style
    - can probe for more in-depth responses
    - reduce item non-response
  - high response rates can be obtained with heterogeneous samples (e.g., general public) and homogeneous, specialized samples (e.g., agency directors, cancer patients, students, etc.)



# Face-to-face Interviews

- Disadvantages
  - difficult to obtain population-based sample
    - major disadvantage for health behavior studies
  - recruitment and training of interviewers is expensive and time-consuming
    - costs increase even more when respondents are widely dispersed



## Face-to-face Interviews

- Disadvantages (continued)
  - concerns about interviewer safety
    - e.g., isolated rural areas, inner city neighborhoods
  - accurate answers may be difficult to obtain
    - increased likelihood of social desirability bias and interviewer distortion
    - consultation with others may be difficult to control



# Telephone Interview Questionnaires

- Main types
  - Paper and pencil
  - Computer-assisted telephone interviews (CATI)



# Telephone Interviews

- Advantages

- quickest method, if collection time is important
- generally best means (and sometimes only means) of obtaining population-based data
  - percentage of households with telephones is high in most parts of the country
  - random-digit-dialing (RDD) can reach listed and unlisted households
  - selection of respondents within sampling units can be controlled (e.g., oldest male, youngest female, etc.)



# Telephone Interviews

- Advantages (continued)

- less costly than face-to-face interviews
- allows interaction with respondent
- menu-driven CATI ensures all appropriate questions are asked in proper sequence
  - screening questions can eliminate respondents who don't qualify for inclusion early in the process
- item non-response is minimized



# Telephone Interviews

- Advantages (continued)
  - open-ended questions can be asked
  - high response rates can be obtained with both heterogeneous and homogeneous samples
  - telephone interviewers may be easier to select
    - e.g., less concern about personal appearance
  - monitoring of interviewer performance is easier
    - live monitoring
    - call-backs



# Telephone Interviews

- Advantages (continued)
  - training time for interviewers may be shorter
  - contamination by others is minimized
  - it may be possible to document reasons for refusal and characteristics of non-responders
    - Note: This is theoretically possible, realistically unlikely



# Telephone Interviews

- Disadvantages
  - potential biases in sampling
    - no phone, no access
    - specific subgroups (e.g., minorities, low-income respondents) often under-represented
  - requires specialized equipment and trained personnel
  - more costly than mailed questionnaires



# Telephone Interviews

- Disadvantages (continued)
  - may be difficult to confirm that selected respondent is the interviewee
  - may be difficult to control consultation with other household members
  - one household member may serve as “gatekeeper” and prevent access to selected respondent (e.g., “why do you want to talk with my husband; I’ll answer your questions)
  - need to avoid complex questions



# Web-based Interviews

- Advantages

- quick method, if collection time is important
- less costly than mailed or other written questionnaires or face-to-face interviews
- open-ended questions can be asked
- may be more convenient to administer in some settings (e.g., classroom) than paper and pencil



# Web-based Interviews

- Disadvantages
  - potential biases in sampling
    - no Internet connection, no access
    - specific subgroups (e.g., minorities, low-income respondents) often under-represented
  - requires computer and Internet connection for each respondent



# First Steps in Questionnaire Design

- Know the purpose
- Define specific study hypotheses (if research-oriented)
- Identify resources available (budget, equipment, personnel, etc.)
- Determine sample size and method of administration
- Set target dates for start and completion
- Is IRB approval needed?



# Overall Questionnaire Design

- Preliminary Statements
  - Introduction: identify interviewer, institution and purpose of the study or research project (NEVER SAY ‘SURVEY’)
  - Ascertain correct phone # (if telephone interview)
  - Identify and select respondent
  - Assure confidentiality of information obtained
    - if needed, obtain written informed consent
  - “Interview will take only a short time”



# Ordering of Questions

- Initial questions should be non-threatening, easy to answer and of interest to respondent
- Group questions crucial to success of project toward front end of questionnaire



# Ordering of Questions

- Sequence questions, with generic questions (e.g., “Have you smoked at least 100 cigarettes in your entire life?”) before specific questions (e.g., “Do you now smoke cigarettes every day, some days, or not at all?”)

- Group questions by topic

- respondents will answer 20 tobacco-use questions but will often complain if you ask 10 questions on smoking, go on to another topic, then ask 10 more smoking questions



# Ordering of Questions

- Order questions so that a response already made will not influence the response to a question yet to be asked.
- Determine in advance what constitutes a “completed interview”
  - i.e., a CATI questionnaire may contain 125 questions but if a respondent answers the last demographic question (#85), it is considered a complete interview



# Designing Questions

- If available, use already-developed questions with known reliability and validity
- Design questions to fit mode of administration
- Avoid questions that have a “right” answer
- Avoid multiple or double-barreled questions



# Designing Questions

- Keep questions brief
- Use simple terms
- Avoid ambiguous or value-laden words or phrases
- Insure response options are mutually exclusive
- Insure that response options are exhaustive



# Designing Questions

- Except in rare circumstances, include “Don’t know” and “Refused” as response options
- Limit the number of response options
  - may include “Other (specify: \_\_\_\_\_)”
- Scale response options to create equal distribution of responses
  - always, nearly always, sometimes, seldom, never



# Importance of Pilot Testing

- Always pre-test and pilot test new questions
- If necessary, conduct more than one pilot
- Pay particular attention to response options
- If possible, pilot test entire questionnaire



# Questionnaire Length

- Try not to exceed optimal length
  - Adults
    - < 20 min. CATI; < 1hr face-to-face
    - conventional wisdom for CATI = 100 questions
    - through experience, 125 questions established as guideline for Behavioral Risk Factor Surveillance System
  - Youth
    - 60-65 questions (g. 6-7); 65-80 questions (g. 8-12)



# Questionnaire Length

- Make sure that questions serve a purpose
  - e.g., baseline measure, outcome indicator, ascertain trend, evaluate intervention progress, etc.
  - do not include questions just because they might be of interest to someone, someday



## Closing Statements

- Thank respondent for participation
- Be prepared to answer questions, provide telephone # or address of investigators, and/or copy of results
- Most importantly, be polite and respectful throughout the interview.



## Tips

- Appearance of written questionnaire is important
- For face-to-face interviews, interviewers' appearance and demeanor is important
- For CATI interviews, quality of equipment is important
  - e.g., comfort of interviewers, sound that is transmitted to respondent, etc.



## Tips

- Train supervisors and interviewers
  - training should be ongoing
  - monitor quality and productivity
- Listen to what interviewers/supervisors have to say
- Identify and resolve problems
- Monitor progress, weekly or more often
- Conduct continuous quality assurance